

CLAIMS

1. A plastic substrate for use in optical instruments,
wherein the plastic substrate comprises a composite
substrate in which fibers are embedded in a resin matrix, the
5 fibers being arranged in at least one predetermined direction
within a plane of the composite substrate, and
wherein the composite substrate substantially transmits
visible radiation and has a predefined retardation that is
associated with the predetermined direction in which the
10 fibers are arranged.

2. The plastic substrate of claim 1, wherein the at
least one predetermined direction in which the fibers are
arranged includes two or more directions.

15

3. The plastic substrate of claim 2, wherein the at
least one predetermined direction includes two nearly
orthogonal directions.

20

4. The plastic substrate of claim 3, wherein the

composite substrate has an in-plane retardation of substantially zero.

5. The plastic substrate of claim 3 or 4, wherein the composite substrate has negative uniaxial anisotropy.

6. The plastic substrate of claim 1 or 2, wherein the composite substrate functions as a quarter-wave plate.

10 7. The plastic substrate of one of claims 1 to 6, wherein the fibers are embedded in the resin matrix as a bundle of fibers, a woven fabric or a nonwoven fabric.

8. The plastic substrate of one of claims 1 to 7, 15 further comprising a protective coating on at least one principal surface of the composite substrate.

9. A liquid crystal display device comprising the plastic substrate of one of claims 1 to 8 and a liquid 20 crystal layer.

10. The liquid crystal display device of claim 9,
further comprising a polarizer, which is arranged such that
the absorption axis of the polarizer is either substantially
parallel or substantially perpendicular to the at least one
5 predetermined direction in which the fibers are arranged.